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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/727,147

11/29/2000

Matti Halme

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01/25/2005

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EXAMINER

SEFCHECK, GREGORY B

ART UNIT

PAPER NUMBER

2662

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b> 09/727,147	<b>Applicant(s)</b> HALME, MATTI	
	<b>Examiner</b> Gregory B Sefcheck	<b>Art Unit</b> 2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 July 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 and 22 is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

- Applicant's Amendment filed 7/13/2004 is acknowledged.
- The previous objection to the Title of the invention is withdrawn in light of the newly submitted Title.
- The previous rejection of claims 11, 14, and 18 under 35 USC 112, 2<sup>nd</sup> paragraph are withdrawn in light of the present amendments.
- Claims 20-22 are newly added.
- Claims 1-22 are pending.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8 and 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jorgensen (US006680922B1) in view of Chiu et al. (US006526022B1), hereafter Chiu.

- In regards to Claims 1-8 and 11-20,  
Jorgensen discloses recognition and operation of virtual private networks (Title).  
Jorgensen discloses a network and software (system inherently utilizes software to execute processes within the network), that uses the IPSec protocol in tunnel mode

for communicating between nodes in a VPN, such communication of packets between Host Workstation 136a and a subscriber 306d (Figs. 4, 17; Col. 45, lines 11-18; Col. 46, lines 6-32; claim 19,20 – sw for a network node communicating with a second node; claim 11,13,14,15,18 – network node for communicating with a second node node; claim 1,2,8,11,13,14,15,18,19,20 – employing IPSec protocol for tunneling IP packets between the source and destination).

Jorgensen does not disclose monitoring of the links over which IPSec transmission between a source and destination in

Chiu discloses congestion and flow control detection (monitoring) of communication links in a network (Title; Abstract; Fig. 1; claim 1,2,8 – method for monitoring an active communication link between a source node and a destination node).

Chiu shows that a Repair Head 110-4 transmits ACK messages along a monitored communication path to a sender station 102 as numbered messages are successfully received (Col. 5, lines 57-65). Similarly, destination stations 110-1 through 110-3 transmit ACK messages along their communication paths to the Repair Head 110-4 as messages are successfully received (Col. 6, lines 8-15). ACK messages are sent to acknowledge a predetermined window of packets at a time (Col. 16, lines 62-67; claim 1,2,8,11,13,14,15,18,19,20 – transmitting an ack packet by the destination if at least one of a first and second condition is fulfilled; claim 1,2,8,14,15,18,19 – first condition being the reception of at least a predetermined number of IPSec packets after

transmission of the previous ack; second condition being reception of an IPSec packet after a predetermined time has passed after transmission of the previous ack packet).

Chiu further shows that ACK messages contains a sequence number and a bit map length (Col. 17, lines 21-42; claim 2,11,13,15,18,19,20 – ack packet comprises at least the sequence number of the last received IPSec packet and at least one value corresponding to the amount of data received via the link; claim 3,5,16 – ack packet comprises a packet counter value indicating the number of packets received via the link; claim 4,5,17 – ack packet comprises a byte counter value indicating the number of bytes received via the link).

Chiu discloses that the transmission rate of packets by the source station and by the repair head is dynamically adjusted. This is done by keeping the rate as high as possible so as to fully use the bandwidth of the network with consideration to the ACK and NACK messages received for each transmission, ensuring that packets are not lost due to congestion (maintaining an acceptable success rate of packet transmission; Col. 8, lines 28-44; claim 6,11,18,19 – determining the packet success rate of the link partly on the basis of information contained in an ack packet; claim 7,12 – determining the throughput of the link partly on the basis of the information contained in an ack packet).

Chiu discloses that a cache of transmitted packets, including sequence number, is maintained (Col. 3, lines 51-54). Chiu shows that packet transmissions are scheduled according to a predetermined rate by injecting an amount of sleep time between packet transmissions (Col. 12-13, lines 65-7). Reception of ACK messages corresponding to these transmissions indicates a round trip time on the link (claim 8,13,20 – storing of the

sequence number and the transmission time of each IPsec packet transmitted from the source to the destination in a memory; claim 8,13,20 – determining the round trip time of the link on the basis of the reception time of an ack packet and the stored transmission time of the corresponding transmitted packet).

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the network and software of Jorgensen using the method of monitoring a link through the transmission and reception of ACK packets, as disclosed by Chiu. This modification would provide verifiable transmission with efficient error recovery of lost data over a network while maintaining the benefits of a secure transmission using the IPsec protocol shown in Jorgensen.

3. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jorgensen in view of Chiu as applied to claim 8 above, and further in view of Tam (US006622172B1) and Garcia-Luna-Aceves et al. (US 20010013856A1), hereafter Garcia.

- In regards to Claims 9 and 10,

Jorgensen in view of Chiu discloses recognition and operation of links in a virtual private network that covers the limitations of claim 9 for monitoring an active link between the source and destination as shown above regarding claim 8.

Neither Jorgensen nor Chiu discloses the monitoring of an inactive link between the source and destination as stated in claim 9.

Tam discloses a packet transmission system utilizing TCP/IP that uses a probe packet to measure the roundtrip time of a communication link that is inactive (Fig. 2; Col. 11, lines 45-60). Tam shows that a Round Trip Time Estimation module 12 uses a probe packet (PROBE) transmission and return paths 22,24 shown in isolation from the DAT arrival path 26 and the ACK transmission path 28. The paths share the same input/output resources in the TCP protocol 10 (claim 9 – monitoring an inactive link between the source and destination; claim 9 – transmitting a probe packet from the source to the destination via the inactive link; claim 9 – storing the transmission time of the probe packet in memory; claim 9 – transmitting a response packet to the received probe packet from the destination to the source; claim 9 – determining a round trip time of the inactive link from the difference of the reception time of the response packet and the stored transmission time of the corresponding probe packet; claim 10 – determining the packet success rate of an inactive link from the number of received response packets to a plurality of transmitted probe packets).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the network and method of Jorgensen in view of Chiu by monitoring inactive links by transmitting and receiving probe packets to determine connectivity and round trip delay time of the link, as shown by Tam. The use of a probe packet for determining connectivity and round trip time of an inactive link interconnects elements of the network by the flow of data and information, thereby connecting the network in

terms of functionality rather than merely through hardware (Tam, Col. 11, lines 45-48) and thus enabling efficient operation of the system.

Tam does not disclose maintaining the status of active and inactive links or replacing active links with inactive links based on the results of the monitoring.

Garcia discloses a unified routing scheme for ad-hoc internetworking. Garcia shows that routing metrics such as link delay are determined using routing update messages and acknowledgements (Figs. 6-8) and used in routing algorithms to choose active paths of minimum delay (Pg. 10, paragraph 14; claim 9 – maintaining present status of the active and inactive link or replacing active link with inactive link based on the results of the monitoring).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the network and method of Jorgensen in view of Chiu by monitoring inactive links by transmitting and receiving a probe packet to determine round trip time of the link, as shown by Tam, and replacing active links with inactive links based on the monitoring, as shown by Garcia. Utilizing the results of the monitored data and information that connects the network in order to select the links to be used in transmission (i.e. maintain active links or replace active links with inactive links) as shown by Garcia provides increased total throughput of the system and maximizes the use of the network bandwidth.



***Allowable Subject Matter***

4. Claims 21 and 22 are allowed.

The prior art of record does not teach or fairly suggest a method of monitoring a communication link between a source and destination employing the IPSec protocol for tunneling IP packets of one or more TCP/IP connections, where the transmission of acknowledgement packets by the destination node are transmitted separately from TCP retransmission scheme carried out on the one or more TCP/IP connections when at least a predetermined number of IPSec packets are received after the previous acknowledgement packet or an IPSec packet is received after a predetermined time has passed after the previous acknowledgement packet.

***Response to Arguments***

5. Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory B Sefcheck whose telephone number is 571-272-3098. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GBS  
1-11-2005



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